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### Section 12

# Uintah Basin Plan

### Utah State Water Plan

## Water Quality

Surface water in the upper watersheds is of good quality and often suitable for culinary use only after disinfection for microbiological quality assurance. Quality of water deteriorates as it moves downstream.

#### 12.1 Introduction

This section presents data and information on existing levels of water quality throughout the Uintah Basin. Sources of pollution are identified, problems and solutions are discussed, and a recommendation is given for control and improvement by responsible agencies.

#### 12.2 Setting

The Uintah Basin Study Area includes the five hydrologic subareas as described in Section 3 and shown by Figure 3-2.

# 12.3 Organizations and Regulations

Maintaining water quality requires the cooperation of a wide range of public and private interests. The responsibility for providing leadership falls mostly on local government agencies, subject to state and federal regulatory programs.

#### 12.3.1 Local

Towns, cities and counties have primary responsibility for water pollution control within their jurisdiction. These responsibilities and authorities are contained in Section 10, 11, 17, 19 and 73 of the *Utah Code Annotated, 1953, Amended* (UCA). The Tri-County Health Department, with an office in Vernal, has significant jurisdiction over many aspects of pollution control in the Uintah Basin. City and

county government water and health agencies also have responsibility to follow and enforce state laws and rules in the operation of their facilities.

The locally led Dinosaurland Resource Conservation and Development Council (RC&D) currently participates with the Utah Division of Water Quality in a watershed study to improve water quality in the Uintah Basin. Table 12-1 shows the major wastewater treatment facilities operated by local agencies.



Lower Ashley Creek

## 12.3.2 State Department of Environmental Quality

Under the Utah Water Quality Act, the Division of Water Quality (DWQ) of the Department of Environmental Quality (DEQ) and the Utah Board of Water Quality are responsible for adopting, enforcing

V	Tab Vastewater Tr	le 12-1 eatment Faci	lities		
City	Туре	Disposal Method	Design Capacity (ac-ft/day)	Current Average Flow (mgd)	Volume (ac-ft/ day)
Daggett County					
Dinosaur Nat'l Monument	Lagoon	TC	0.03	0.005	0.02
Dutch John	"	TC	0.50	0.162	0.50
Flaming Gorge	"	TC	0.25	0.003	0.01
Manila	"	TC	0.12	0.082	0.25
Duchesne County					
Altamont	Lagoon	TC	0.05	0.02	0.06
Duchesne	"	FDL	0.42	0.18	0.55
Myton	"	TC	0.17	0.10	0.03
Roosevelt	"	LWLA	0.12	0.20	0.61
Tabiona	"	TC	0.04	0.03	0.09
Neola	"	FDL	0.07	0.16	0.49
Uintah County					
Bonanza Plant	Lagoon	TC	0.03	0.009	0.03
Ashley Valley	"	LWLA	3.9	2.76	8.47

Note: TC = Total Containment Lagoon

LWLA = Lagoon with Land Application FDL = Facultative Discharging Lagoon

and administering state (Utah Water Quality Act, *UCA 19-5*) and federal (Clean Water Act) water quality regulations. Their charge is to maintain acceptable levels of water quality. The DWQ monitors rivers, streams, lakes and groundwater for adherence to water quality standards.

The Clean Water Act gives responsibility to the state DEQ for the enforcement of federal regulations dealing with point source discharges. These federal regulations state: "... the discharge of any pollutant directly into the waters of the United States from a new or existing point source is prohibited unless the point source has a valid and active National Pollutant Discharge Elimination System (NPDES) permit."

Limits on loading rates of various pollutants are established by state agencies with consideration given to EPA regulations. However, state agencies can adopt more stringent rules. Wastewater treatment plants and/or industrial businesses discharging pollutants into Utah waters are issued a

Utah Pollutant Discharge Elimination System (UPDES) permit. These permits are valid for five years and must be renewed with a reevaluation of pollutant limitations. Enforcement of NPDES/UPDES permit requirements is accomplished by effluent monitoring programs supervised by the Division of Water Quality.

The Clean Water Act also assigns responsibility for the Non-Point Source Program (NPS), Section 319(b), to DWQ. This is implemented with collaboration from the Utah Department of Agriculture and Food and the Utah Soil Conservation Commission.

The Division of Water Quality developed a *Ground Water Quality Protection Strategy* for the State of Utah based on an executive order issued in 1984 by the Governor. Groundwater discharge permits are required for activities that may affect these waters.

**Department of Agriculture and Food -** The Environmental Quality Section of the Utah

Department of Agriculture and Food implements Utah's non-point water pollution control and prevention program administered by the Division of Water Quality. This is partially funded through federal grants from the Environmental Protection Agency(EPA) and partially supported by matching funds from state and local agencies and private sources. The program is divided into three parts: watershed management projects, groundwater and surface monitoring, and information and education. Public information programs use newsletters, brochures, videos and slide shows, and target public schools and adult education programs.

The Utah Board of Water Quality has also established stream and reservoir classifications. <sup>153</sup> Table 12-2 shows the current water quality classes and classification of streams for the major water storage facilities. Table 12-3 shows the classification of streams in the Uintah Basin.

### 12.3.3 Federal<sup>63,64</sup>

Congress passed the federal Water Pollution Control Act in 1972 to establish regulatory programs to improve the quality of the nation's waters. The act was amended in 1977 and became known as the Clean Water Act (CWA). Additional amendments were made in 1987. The CWA amendments provide regulations to deal with the growing national toxic water pollutant problem and further to refine the EPA's enforcement priorities. The amendments substantially increased the EPA's authority to enforce all water quality regulations associated with new federal mandates to clean up the nation's streams, rivers, reservoirs and lakes.

In the mid-1950s, the federal government began offering funding programs to state water pollution control agencies to help in the ongoing construction of wastewater treatment facilities. These early grants provided funding to pay for 30 to 55 percent of the total construction costs. This source of federal funds, along with monies provided through the Utah Water Pollution Control Act, (UWPCA), helped to finance most wastewater treatment facilities in the state.

From 1972 to 1989, more than \$14.5 million in EPA grants were spent to construct or enlarge wastewater treatment and collection facilities throughout the Uintah Basin. Towns, cities, rural

communities and some sewer improvement districts have benefitted from this federal funding.

Federal expenditures for public works drastically decreased by 1990 and most grant programs for construction and upgrades were eliminated. Wastewater treatment funding now is only available through programs administered by the Division of Water Quality (DWQ). Expenditures in the Uintah Basin have averaged \$1.6 million per year for new construction over the last several years.

Federal standards for solid waste and hazardous material are set forth under the Comprehensive Environmental Response and Comprehensive Liability Act (CERCLA). These standards are regulated by the EPA, and compliance is verified through local health department monitoring programs.

#### 12.4 Water Quality Programs

Surface and groundwater quality is determined by the contaminants discharged from point and non-point discharges to receiving streams and aquifers. Point source problems arise from effluent discharges from wastewater treatment facilities and industrial processing plants. Non-point pollution is surface runoff generated from agricultural, municipal and industrial activities, erosion and other natural processes, and many other categories. Runoff entering surface streams from urban development is no longer considered non-point source discharge and is subject to UPDES regulations. Sewage discharge from watercraft is also a significant water quality problem.

#### 12.4.1 Surface Water

The most recently completed surface water quality evaluation of the Uintah Basin is the *Uinta Watershed Management Unit-Stream Assessment*, by the Utah Division of Water Quality of the Department of Environmental Quality, October 1997. Substantial material from that report is reported herein either verbatim or in an abbreviated form.

Data collected from 102 sampling sites were used to assess the water quality of streams in the study area. Fifty-two of these were monitored by the Utah Division of Water Quality on an intensive basis

Surface \	Table 12-2 Water Classification	ns of Reservo	irs	
Lakes		CI	asses	
Strawberry Reservoir	1C	2A	3A	4
Starvation Reservoir	1C	2A	3A	4
Currant Creek Reservoir	1C	2A	3A	4
Upper Stillwater Reservoir	1C	2A	3A	4
Steinaker Reservoir	1C	2A	3A	4
Red Fleet Reservoir	1C	2A	3A	4
Flaming Gorge Reservoir	1C	2A	3A	4
Big Sand Wash Reservoir	1C	2A	3A	4
Moon Lake	1C	2B	3A	4

- 1C Protected for domestic purposes with prior treatment by processes as required by the Utah Department of Health.
- 2A Protected for primary contact recreation such as swimming.
- 2B Protected for secondary contact recreation such as boating, wading, or similar uses.
- 3A Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.
- 3B Protected for warm water species of fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.
- 3D Protected for waterfowl, shore birds and other water oriented wildlife not included in 3A, 3B, or 3C including the necessary aquatic organisms in their food chain.
- 4 Protected for agricultural uses including crop irrigation and stock watering.

from March 1995 to June 1996. Samples were collected every two weeks during spring runoff in 1995 and 1996 and then monthly except for December 1995 at these stations. Data from samples collected by the U. S. Forest Service at 12 sites on tributary streams to Strawberry Reservoir and one below the reservoir, and an additional 25 samples collected by the Forest Service on the north slope of the Uinta Mountains, were used to assess streams on these federal lands. The USFS data were collected from May 1992 to November 1996. To further supplement data collection, the Bureau of Land Management (BLM) collected samples at 12 sites during 1995 and 1996.

Data Analysis - All water quality sample data and field data were entered into the Division of Water Quality's database and compared against the state's water quality standards. Because of a change in the method of assessing the impacts of nutrients, those waters that had elevated levels of phosphorus were identified. If there were no additional data to determine if water quality impairments had occurred, these elevated phosphorus waters were not listed on the 303(d) list, Table 12-4. However, they were identified as needing further study.

Results - This study area has an estimated 3,536 perennial stream miles, including the main stem Green River. An assessment of water quality beneficial-use support was made on 2,834 miles (80 percent) of the total stream miles. Of these, 2,208 miles were assessed as fully supporting all of their beneficial uses, 240 miles were assessed as partially supporting, and 386 miles were assessed as

Table 12-3 Surface Water Classifications of St	reams			
Streams		Classif	ication	
Green River, Flaming Gorge Reservoir to Headwater	2B	3A		4
Green River, Flaming Gorge Reservoir to Yampa River	2B	3A		4
Green River below Yampa River	2B	3B	3D	4
Ashley Creek above Steinaker Reservoir Diversion	2B	3A		4
Ashley Creek below Steinaker Reservoir Diversion	2B	3A		4
Brush Creek above Red Fleet Reservoir	2B	3A		4
Brush Creek below Red Fleet Reservoir	2B	3B		4
Whiterocks River above confluence with Uinta River	2B	3A		4
Uinta River above confluence with Whiterocks River	2B	3A		4
Uinta River below confluence with Whiterocks River	2B	3A		4
Yellowstone River above Crystal Ranch	2B	3A		4
Yellowstone River below Crystal Ranch	2B	3A		4
Lake Fork River above Moon Lake	2B	3A	3D	4
Lake Fork River below Moon Lake	2B	3A	3D	4
Rock Creek above Upper Stillwater Dam	2B	3A		4
Rock Creek below Upper Stillwater Dam/	2B	3A		4
Water Treatment Plant	1C			
Duchesne River above confluence with Rock Creek	2B	3A		4
Duchesne River above confluence with Strawberry River	2B	3B		4
Duchesne River below confluence with Strawberry River	2B	3A		4
Strawberry River above Strawberry Reservoir	2B	3A	3D	4
Strawberry River below Strawberry Reservoir	2B	3A		4
Sheep Creek above Flaming Gorge Reservoir	2B	3A		4
Henrys Fork above Flaming Gorge Reservoir	2B	3A		4
Smiths Fork above Stateline Reservoir	2B	3A		4
Blacks Fork above Meeks Cabin Reservoir	2B	3A		4
White River above confluence with Green River	2B	3B		4
Indian Creek above confluence with Duchesne River	2B	3B		4
Pot Creek above confluence with Green River	2B	3B		4
Beaver Creek above Wyoming state line	2B	3A		4
Birch Creek below Wyoming state line	2B	3A		4
Burnt Creek above Hoop Lake	2B	3A		4
Carter Creek above Flaming Gorge Reservoir	2B	3B		4
Lodge Pole Creek above Sheep Creek	2B	3B		4
Classification description shown in Table 12-2.				

nonsupporting at least one beneficial use. In addition, 497 stream miles were identified as needing further evaluation because high concentrations of total phosphorus preliminarily preclude determination of whether or not their beneficial uses are being supported. The major causes of impact were total dissolved solids,

temperature and habitat alterations. Aquatic wildlife and agricultural use were the two principal beneficial uses that indicated impairment. The major sources of impairment were agricultural activities, habitat modification and hydrological modification.

Stream Miles  Orado state 58.74  o headwaters. 13.95 3.47  sservoir to 17.16  ver to 3.54  ov Creek to 2.05  oir to 70  r to 8.16  rs. 21.98  te line to 36.52  oming state line 30.06	Table 12-4 [303(d) List] Beneficial Use Assessment for Water Bodies Located in the Uintah Watershed Management Area	Table 12-4 [303(d) List] Bodies Located in the	it] ie Uintah W	/atershed Ma	anagement A	rea	
Green River and some tributaries from Utah-Colorado state line to Flaming Gorge Reservoir.  Red Creek-tributaries, confluence Green River to headwaters.  Birch Spring Draw-tributaries, Flaming Gorge Reservoir to headwaters.  Florence Creek-tributaries, confluence Green River to 17.16 headwaters.  Florence Creek-tributaries, confluence Green River to 3.54 headwaters.  Goslin Creek-tributaries, confluence Green River to 2.05 Utah-Colorado state line.  Sheep Creek-tributaries, Flaming Gorge Reservoir to headwaters.  Gorge Creek-tributaries, confluence Green River to 8.16 headwaters.  Gorge Creek-tributaries, Crouse Dam to headwaters.  Pot Creek-tributaries, Utah-Wyoming state line to headwaters.  Burnt Fork Creek-tributaries, Utah-Wyoming state line to headwaters.  Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line to to headwaters.	scription		Stream Miles	Miles Assessed	Miles Fully Supporting	Miles Partially Supporting	Miles Not Supporting
Green River and some tributaries from Utah-Colorado state line to Flaming Gorge Reservoir.  Red Creek-tributaries, confluence Green River to headwaters.  Birch Spring Draw-tributaries, Flaming Gorge Reservoir to headwaters.  Florence Creek-tributaries, confluence Green River to 16.35 headwaters.  Goslin Creek-tributaries, confluence Green River to 3.54 headwaters.  Co-Wi-Yu-Kuts Creek-tributaries, confluence Willow Creek to 2.05 Utah-Colorado state line.  Sheep Creek-tributaries, Flaming Gorge Reservoir to headwaters.  Gorge Creek-tributaries, confluence Green River to headwaters.  Gorge Creek-tributaries, Utah-Wyoming state line to headwaters.  Pot Creek-tributaries, Utah-Wyoming state line to headwaters.  Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line to to headwaters.  Middle Fork Beaver Creek-Spring Creek Poison 26.77							
Red Creek-tributaries, confluence Green River to headwaters.  Birch Spring Draw-tributaries, Flaming Gorge Reservoir to 17.16 headwaters.  Florence Creek-tributaries, confluence Green River to 16.35 headwaters.  Goslin Creek-tributaries, confluence Green River to 3.54 headwaters.  Co-Wi-Yu-Kuts Creek-tributaries, confluence Willow Creek to 2.05 Utah-Colorado state line.  Sheep Creek-tributaries, Flaming Gorge Reservoir to 70 headwaters.  Gorge Creek-tributaries, confluence Green River to 8.16 headwaters.  Pot Creek-tributaries, Utah-Wyoming state line to headwaters.  Pot Creek-tributaries, Utah-Wyoming state line to headwaters.  Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line to headwaters.  Creek West Fork Beaver Creek Spring Creek Poison 26.72	some tributaries from Utah-Conge Reservoir.	olorado state	58.74	58.74	58.74	0	0
Birch Spring Draw-tributaries, Flaming Gorge Reservoir to headwaters.  Florence Creek-tributaries, confluence Green River to 16.35 headwaters.  Goslin Creek-tributaries, confluence Green River to 3.54 headwaters.  O-Wi-Yu-Kuts Creek-tributaries, confluence Willow Creek to 2.05 Utah-Colorado state line.  Sheep Creek-tributaries, Flaming Gorge Reservoir to headwaters.  Gorge Creek-tributaries, confluence Green River to 8.16 headwaters.  Pot Creek-tributaries, Crouse Dam to headwaters.  Pot Creek-tributaries, Utah-Wyoming state line to headwaters.  Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line to to headwaters.  Middle Fork Beaver Creek Spring Creek Poison 26.72	ıries, confluence Green River	to headwaters.	13.95	0			
Birch Spring Draw-tributaries, Flaming Gorge Reservoir to headwaters.  Florence Creek-tributaries, confluence Green River to headwaters.  Goslin Creek-tributaries, confluence Green River to 3.54 headwaters.  O-Wi-Yu-Kuts Creek-tributaries, confluence Willow Creek to 2.05 Utah-Colorado state line.  Sheep Creek-tributaries, Flaming Gorge Reservoir to headwaters.  Gorge Creek-tributaries, confluence Green River to 8.16 headwaters.  Pot Creek-tributaries, Utah-Wyoming state line to headwaters.  Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line to headwaters.  Middle Fork Beaver Creek-Spring Creek Poison 26.72			3.47	0	ı	ı	ı
Florence Creek-tributaries, confluence Green River to headwaters Goslin Creek-tributaries, confluence Green River to 3.54 headwaters.  Goslin Creek-tributaries, confluence Willow Creek to 2.05 Utah-Colorado state line. Sheep Creek-tributaries, Flaming Gorge Reservoir to headwaters. Gorge Creek-tributaries, confluence Green River to 8.16 headwaters.  Pot Creek-tributaries, Crouse Dam to headwaters. Pot Creek-tributaries, Utah-Wyoming state line to 36.52 headwaters. Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line to headwaters.	v-tributaries, Flaming Gorge F	Reservoir to	17.16	0	1	ı	1
Goslin Creek-tributaries, confluence Green River to headwaters.  2.47  S Creek O-Wi-Yu-Kuts Creek-tributaries, confluence Willow Creek to 2.05 Utah-Colorado state line. Sheep Creek-tributaries, Flaming Gorge Reservoir to headwaters. Gorge Creek-tributaries, confluence Green River to headwaters.  Gorge Creek-tributaries, confluence Green River to headwaters.  Pot Creek-tributaries, Utah-Wyoming state line to headwaters.  Burnt Fork Creek-tributaries, Utah-Wyoming state line to headwaters.  Middle Fork Beaver Creek Spring Creek Poison  26.72	ibutaries, confluence Green F	River to	16.35	16.35	0	16.35	16.35
s Creek O-Wi-Yu-Kuts Creek-tributaries, confluence Willow Creek to 2.05 Utah-Colorado state line. Sheep Creek-tributaries, Flaming Gorge Reservoir to headwaters. Gorge Creek-tributaries, confluence Green River to 8.16 headwaters. Pot Creek-tributaries, Crouse Dam to headwaters. Pot Creek-tributaries, Utah-Wyoming state line to headwaters. Seaver Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line 30.06 to headwaters.		er to	3.54	0		ı	1
Screek O-Wi-Yu-Kuts Creek-tributaries, confluence Willow Creek to 2.05 Utah-Colorado state line. Sheep Creek-tributaries, Flaming Gorge Reservoir to headwaters. Gorge Creek-tributaries, confluence Green River to 8.16 headwaters. Pot Creek-tributaries, Crouse Dam to headwaters. 21.98 eek Burnt Fork Creek-tributaries, Utah-Wyoming state line to headwaters. Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line 30.06 to headwaters.			2.47	2.47	2.47	0	0
Sheep Creek-tributaries, Flaming Gorge Reservoir to headwaters.  Gorge Creek-tributaries, confluence Green River to 8.16 headwaters.  Pot Creek-tributaries, Crouse Dam to headwaters.  Pot Creek-tributaries, Utah-Wyoming state line to headwaters.  Seaver Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line 30.06 to headwaters.	eek-tributaries, confluence Wi ate line.	illow Creek to	2.05	0		1	1
Gorge Creek-tributaries, confluence Green River to 8.16 headwaters.  Pot Creek-tributaries, Crouse Dam to headwaters. 21.98  The Burnt Fork Creek-tributaries, Utah-Wyoming state line to headwaters. 30.06  To headwaters. 30.06  To headwaters. 30.06  To headwaters. 30.06		voir to	02	70	70	0	0
Creek Burnt Fork Creek-tributaries, Crouse Dam to headwaters. 21.98  Creek Burnt Fork Creek-tributaries, Utah-Wyoming state line to headwaters.  K Beaver Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line 30.06 to headwaters.	utaries, confluence Green Riv	er to	8.16	0	1	1	1
Burnt Fork Creek-tributaries, Utah-Wyoming state line to 36.52 headwaters.  Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line 30.06 to headwaters.  West Fork Beaver Creek Spring Creek Poison 26.72	ies, Crouse Dam to headwat	ers.	21.98	0	1	1	ı
Middle Fork Beaver Creek-tributaries, Utah-Wyoming state line 30.06 to headwaters.  West Fork Beaver Creek Spring Creek Poison	-tributaries, Utah-Wyoming st	ate line to	36.52	36.52	36.52	0	0
West Fork Beaver Creek Spring Creek Poison	er Creek-tributaries, Utah-Wy	oming state line	30.06	30.06	30.06	0	0
Creek-tributaries; Utah-Wyoming state line to headwaters.	r Creek, Spring Creek, Poison Utah-Wyoming state line to he	n neadwaters.	26.72	26.72	26.72	0	0

Be	Table 12-4 [303(d) List] (Continued) Beneficial Use Assessment for Water Bodies Located in the Uintah Watershed Management Area	st] (Contind d in the Uir	ued) Itah Watersh	ned Managem	ent Area	
Water Body Name	Water Body Description	Stream	Miles	Miles Fully	Miles Partially	Miles Not
Henrys Fork River	Henrys Fork River-tributaries, Utah-Wyoming state line to headwaters.	35.54	35.54	35.54	0	0
Dahlgreen Creek	Dahlgreen Creek-tributaries, Utah-Wyoming state line to headwaters.	8.54	8.54	8.54	0	0
Sears Creek	Sears Creek-tributaries, confluence Green River to headwaters.	66.9	6.99	66.9	0	0
Flaming Gorge Reservoir Tributaries	All other tributaries to Flaming Gorge Reservoir not listed separately.	55.64	0	1	1	1
Birch Creek-tribs	Birch Creek-tributaries, Utah-Wyoming state line to headwaters.	9.91	9.91	0	0	0
Cart Creek	Cart Creek and tributaries.	16.84	0	ı	ı	ı
Carter Creek	Carter Creek-tributaries, Flaming Gorge Reservoir to headwaters.	90.12	0	ı	1	ı
Eagle Creek	Eagle Creek-tributaries, Flaming Gorge Reservoir to headwaters.	8.59	0	ı	ı	ı
Willow Creek	Willow Creek-tributaries, from confluence Green River to headwaters (Daggett Co.).	16.37	0	ı	ı	ı
Jackson Creek	Jackson Creek-tributaries, confluence Green River to headwaters.	10.93	0	ı	ı	ı
Goslin Creek	Goslin Creek-tributaries, confluence Green River to headwaters.	3.87	0	ı	ı	ı
Lower Pot Creek	Pot Creek-below reservoirs to Utah-Colorado state line.	0	0	1	1	1
BLACKS FORK						
Blacks Fork	Blacks Fork River-tributaries, Utah-Wyoming state line to headwaters; all other streams from eastern boundary of Blacks Fork River Drainage to the West Boundary of Bear River Drainage.	132.28	132.28	132.8	0	0
Archie Creek	Archie Creek-tributaries, from Utah-Wyoming state line to headwaters	4.72	4.72	4.72	0	0

Ber	Table 12-4 [303(d) List] (Continued)  Beneficial Use Assessment for Water Bodies Located in the Uintah Watershed Management Area	) List] (Cont ed in the Uir	inued) itah Watershe	d Manageme	nt Area	
Water Body Name	Water Body Description	Stream	Miles Assessed	Miles Fully Supporting	Miles Partially Supporting	Miles Not Supporting
Little West Fork	Little West Fork, Utah-Wyoming state line to headwaters.	3.8	3.8	3.8	0	0
East Fork Smiths Fork	East Fork Smiths Fork-tributaries, Utah-Wyoming state line to headwaters.	48.43	48.43	48.43	0	0
Gilbert Creek	Gilbert Creek-tributaries, Utah-Wyoming state line to headwaters.	6.68	6.68	6.68	0	0
West Fork Smiths Fork	West Fork Smiths Fork-tributaries, Utah-Wyoming state line to headwaters.	19.32	19.32	19.32	0	0
LOWER WHITE RIVER						
White River	White River, confluence Green River to Utah-Colorado state line.	74.67	74.67	74.67	0	0
Evacuation Creek	Evacuation Creek-tributaries, confluence White River to headwaters.	0	0	ı	I	1
Lower Bitter Creek	Bitter Creek-tributaries, confluence White River to start of perennial stream (excluding Sweetwater Creek).	0	0		1	
Upper Bitter Creek	Bitter Creek-tributaries, upper portion that is perennial.	24.89	0	1	ı	
Sweetwater Creek	Sweetwater Creek-tributaries, confluence Bitter Creek to headwaters.	3.95	0	ı	ı	1
LOWER GREEN RIVER/DIAMOND MTN						
Green River-2	Green River, Utah-Colorado state line to Duchesne River confluence.	106.94	106.94	106.94	0	0
Pole Creek	Pole Creek	23.26	22.36	23.26	0	0
Jones Hole Creek	Jones Hole Creek-tributaries, confluence Green River to headwaters.	5.85	0	•	1	

Be	Table 12-4 [303(d) List] (Continued) Beneficial Use Assessment for Water Bodies Located in the Uintah Watershed Management Area	List] (Contil ed in the Ui	nued) ntah Watersh	ned Manageme	ent Area	
Water Body Name	Water Body Description	Stream Miles	Miles Assessed	Miles Fully Supporting	Miles Partially Supporting	Miles Not Supporting
Diamond Gulch	Diamond Gulch, near Jones Hole Creek to headwaters.	33.14	0		ı	ı
Lower Ashley Creek	Ashley Creek-tributaries, from confluence Green River Vernal Sewage Lagoons.	15.19	15.19	0	0	303(d) 15.19
Middle Ashley Creek	Ashley Creek-tributaries, from Vernal sewage lagoons to Dry Fork confluence.	4.19	4.19	4.19	0	0
Upper Ashley Creek	Ashley Creek-tributaries, confluence of Dry Fork to headwaters (exclude Dry Fork).	61.73	61.73	61.73	0	0
Dry Fork Creek	Dry Fork Creek-tributaries, confluence Ashley Creek to headwaters.	47.45	47.45	47.45	0	0
Brush Creek	Brush Creek-tributaries, confluence Green River to Red Fleet Dam, not including Little Brush Creek.	23.86	23.86	23.86	0	0
Lower Little Brush Creek	Little Brush Creek-tributaries, confluence Big Brush Creek to mouth of Little Brush Creek Gorge.	6.11	6.11	6.11	0	0
Upper Little Brush Creek	Little Brush Creek-tributaries, from mouth of Little Brush Creek Gorge to headwaters.	34.4	34.4	34.4	0	0
Big Brush Creek	Big Brush Creek-tributaries, Red Fleet Reservoir to headwaters.	41.9	41.9	41.9	0	0
<b>DUCHESNE RIVER</b>						
Duchesne River-1	Duchesne River-tributaries, confluence Green River to Randlett.	19.14	19.14	Nutrients 0.00	303(d) 19.14	0
Duchesne River-2	Duchesne River, Randlett to Myton.	31.82	31.82	Nutrients 0.00	303(d) 31.82	31.82
Duchesne River-3	Duchesne River, from Myton to Strawberry River confluence.	39.97	39.97	Nutrients 39.97	0	0
Duchesne River-4	Duchesne River, from Strawberry River confluence to West Fork Duchesne confluence.	67.28	67.28	Nutrients 67.28	0	0
West Fork Duchesne	West Fork Duchesne River to Duchesne River	67.26	67.26	67.26	0	0

Be	Table 12-4 [303(d) List] (Continued) Beneficial Use Assessment for Water Bodies Located in the Uintah Watershed Management Area	List] (Contiled in the Ui	nued) Intah Watersh	led Manageme	ent Area	
				Miles	Miles	Miles
Water Body Name	Water Body Description	Stream Miles	Miles Assessed	Fully Supporting	Partially Supporting	Not Supporting
North Fork Duchesne	North Fork Duchesne River-tributaries, confluence Duchesne to headwaters	58.87	58.87	58.87	0	0
Indian Canyon	Indian Canyon and tributaries, confluence Duchesne River to headwaters.	44.38	44.38	0	0	303(d) 44.38
Antelope Creek	Antelope Creek and tributaries, confluence Duchesne River to headwaters.	31.38	31.38	0	0	303(d) 31.38
Dry Gulch Creek	Dry Gulch Creek-tributaries, confluence Duchesne River to headwaters.	87.67	87.67	Nutrients 0.00	0	303(d) 87.67
Zimmerman Wash	Zimmerman Wash, confluence Lake Fork River to headwaters.	0.07	0	ı	ı	ı
Lake Fork-1	Lake Fork River-tributaries, confluence Duchesne River to Pigeon Water Creek confluence.	22.36	22.36	0	0	303(d) 22.36
Lake Fork-2	Lake Fork River-tributaries, Pigeon Creek confluence to Yellowstone River confluence (includes Yellowstone River and Pigeon Creek to USNF boundary).	30.87	30.87	0	303(d) 30.87	0
Lake Fork-3	Lake Fork River-tributaries, Yellowstone River confluence to Moon Lake.	35.35	35.35	35.35	0	0
Tributaries to Moon Lake.	Tributaries to Moon Lake.	122.32	122.32	122.32	0	0
Upper Yellowstone	Yellowstone River-tributaries, from USNF boundary to headwaters.	110.50	110/5	110.5	0	0
Upper Rock Creek	Rock Creek-tributaries, from USNF boundary to headwaters.	99.18	99.18	99.18	0	0
Lower Rock Creek	Rock Creek and tributaries, confluence	29.21	29.21	29.21	0	0
Uinta River-1	Uinta River-tributaries, confluence Duchesne River upstream about 9 miles.	8.82	8.82	0	0	303(d) 8.82
Uinta River-2	Uinta River, 9 miles upstream to change in beneficial use.	3.16	3.16	0	0	303(d) 3.16

Water Body Name         Water Body Description         Stream         Miles Miles         Miles Assessed         Miles Parally Parallal Miles         Miles Proporting         Miles Proporting<	B	Table 12-4 [303(d) List] (Continued) Beneficial Use Assessment for Water Bodies Located in the Uintah Watershed Management Area	List] (Contine Ui	nued) ntah Watersh	ned Manageme	ent Area	
Sody Name         Water Body Description         Stream Assessed Supporting Supp					Miles	Miles	Miles
Unita River-tributaries, beneficial use dessification Ariage to USFS boundary dessification Ariage to USFS boundary (excluding Whiterocks River)   Unita River-tributaries, Fridel Water and Unita River-tributaries, Tridel Water Statement Plant to headwaters.   18.81	Water Body Name	Water Body Description	Stream Miles	Miles Assessed	Fully Supporting	Partially Supporting	Not Supporting
iver-4         Uninta River-tributaries, from USFS boundary to headwaters.         85.7         85.7         85.7         0           Whiterocks         Whiterocks River-tributaries, Tridell Water Treatment Plant to headwaters.         18.81         18.81         18.81         0           Whiterocks River-tributaries, Confluence Unitah Plant.         24.73         24.73         24.73         0.00         24.73           River to headwaters.         Deep Creek-tributaries, Confluence Unitah         24.73         24.73         0.00         24.73         0.00           Strawberry         River to headwaters.         0.00         24.73         0.00	Uinta River-3	Uinta River-tributaries, beneficial use classification change to USFS boundary (excluding Whiterocks River).	75.42	75.42	0	303(d) 75.42	0
Whiterocks         Whiterocks River-tributaries, Tridell Water         83.78         83.78         83.78         0           Anhiterocks         Whiterocks River-tributaries, Strawberry         18.81         18.81         18.81         0           Whiterocks River, confluence Unitah River to Deep Creek-tributaries, confluence Unitah         24.73         24.73         Nutrients         303(d)           Break Reservoir to headwaters.         Strawberry River-tributaries, Strawberry Reservoir.         52.52         52.52         52.52         32.473           Strawberry River-tributaries to Strawberry Reservoir.         97.64         97.64         97.64         0           sury-3         Other tributaries to Strawberry Reservoir.         21.79         21.79         21.79         0           sury-3 strawberry River-Carek Dam.         16.09         16.09         16.09         Nutrients         0           soldier Creek Dam.         Soldier Creek Creek Creek Confluence         16.09	Uinta River-4	Uinta River-tributaries, from USFS boundary to headwaters.	85.7	85.7	85.7	0	0
Whiterocks River, confluence Ulintah River to         18.81         18.81         18.81         0           ridel Water Treatment Plant.         Tridel Water Treatment Plant.         24.73         24.73         18.81         0           Beep Creek-tributaries, confluence Uintah         24.73         24.73         10.00         24.73           Briver to headwaters.         52.52         52.52         52.52         52.52         0           Strawberry River-tributaries, Strawberry Reservoir.         97.64         97.64         97.64         0         0           arry-3         Other tributaries to Strawberry River-tributaries, Starvation         21.79         21.79         21.79         0           arry River-3         Strawberry River-tributaries, Starvation         16.09         16.09         16.09         0           arry River-1         Strawberry River, confluence Duchesne River         4.26         4.26         0         -           Surrant Creek Tributaries to Current Creek Reservoir.         60.12         60.12         0         -         -           Currant Creek Tributaries to Red Creek Reservoir.         60.12         0         -         -         -           Red Creek Tributaries to Red Creek Reservoir.         15.53         0         -         -         -	Upper Whiterocks River	Whiterocks River-tributaries, Tridell Water Treatment Plant to headwaters.	83.78	83.78	83.78	0	0
Strawberry River to headwaters.   Strawberry River to headwaters.   Strawberry River to headwaters.   Strawberry River to headwaters.   Strawberry River tributaries, Strawberry Reservoir to headwaters.   Strawberry Reservoir to headwaters.   Strawberry Reservoir to headwaters.   Strawberry Reservoir Creek Confluence to Strawberry River-tributaries to Strawberry River-tributaries (2.1.79	Lower Whiterocks River	Whiterocks River, confluence Uintah River to Tridell Water Treatment Plant.	18.81	18.81	18.81	0	0
Strawberry Strawberry River-tributaries, Strawberry  Strawberry River-Tributaries of Strawberry Reservoir  Preservoir to headwaters.  arry-3  Other tributaries to Strawberry Reservoir  Soldier Creek Dam.  Inbutaries to Starvation Reservoir except  Tributaries to Starvation Reservoir.  Strawberry River, confluence Duchesne River  Currant Creek Tributaries, Red Creek Reservoir.  Currant Creek Reservoir.  Soldier Creek Reservoir.  Strawberry River Creek Reservoir.  Strawberry River Confluence Current Creek Reservoir.  Strawberry River Confluence Current Creek Reservoir.  Strawberry River Confluence Current Creek Reservoir.  Strawberry River Creek Reservoir	Deep Creek	Deep Creek-tributaries, confluence Uintah River to headwaters.	24.73	24.73	Nutrients 0.00	303(d) 24.73	0
Strawberry River-tributaries, Strawberry         52.52         52.52         52.52         0           Reservoir to headwaters.         Other tributaries to Strawberry Reservoir.         97.64         97.64         97.64         0           3 Strawberry River, Current Creek Confluence to Soldier Creek Dam.         21.79         21.79         21.79         0           2 Strawberry River-tributaries, Starvation Reservoir to Avintaquin Creek confluence.         16.09         16.09         Nutrients         0           1 Strawberry River, confluence Duchesne River         4.26         4.26         4.26         0           2 Tributaries to Starvation Reservoir Creek Reservoir.         58.98         0         -         -           3 Strawberry River, confluence Duchesne River         4.26         4.26         0         -         -           4 Current Creek-tributaries, Red Creek Reservoir.         58.98         0         -         -         -           5 Creek to Red Creek Reservoir.         15.53         0         -         -         -           6 Creek to Red Creek Reservoir.         15.55         Nutrients         0         -         -           7 Creek to Red Creek Reservoir.         15.55         Nutrients         0         -         -	STRAWBERRY RIVER						
3 Strawberry Roservoir.         97.64         97.64         97.64         07.64         07.64         07.64         07.64         07.64         07.64         07.64         07.64         07.64         0           3 Strawberry River, Current Creek Confluence.         16.09         16.09         16.09         Nutrients         0           2 Strawberry River-tributaries, Starvation Reservoir except         10.04         0         -         -           3 Strawberry River, confluence Duchesne River         4.26         4.26         0         -         -           3 Strawberry River, confluence Duchesne River         58.98         0         -         -         -           4 Current Creek-tributaries, Red Creek         60.12         60.12         Nutrients         0           Current Creek-tributaries to Red Creek Reservoir.         15.53         0         -         -           Tributaries to Red Creek Reservoir.         15.55         Nutrients         0         -         -           Red Creek-tributaries, confluence Current         15.55         Nutrients         0         -         -	Upper Strawberry	Strawberry River-tributaries, Strawberry Reservoir to headwaters.	52.52	52.52	52.52	0	0
3 Strawberry River, Current Creek confluence to Soldier Creek Dam.         21.79         21.79         0           2 Strawberry River-tributaries, Starvation Reservoir to Avintaquin Creek confluence.         16.09         Nutrients         0           1 Tributaries to Starvation Reservoir except         10.04         0         -         -           1 Strawberry River, confluence Duchesne River         4.26         4.26         0           2 Strawberry River, confluence Duchesne River         58.98         0         -           2 Current Creek Reservoir.         60.12         60.12         Nutrients           3 Current Creek Reservoir.         15.53         0         -           4 Red Creek Tributaries, confluence Current         15.55         Nutrients         0           1 Red Creek Tributaries, confluence Current         15.55         Nutrients         0	Strawberry-3	Other tributaries to Strawberry Reservoir.	97.64	97.64	97.64	0	0
Strawberry River-tributaries, Starvation Reservoir to Avintaquin Creek confluence. Tributaries to Starvation Reservoir except  Strawberry River, confluence Duchesne River  Current Creek Reservoir.  Current Creek Reservoir.  Tributaries to Current Creek Reservoir.  Current Creek-tributaries, Red Creek Confluence to Current Creek Reservoir.  Tributaries to Red Creek Reservoir.	Strawberry River-3	Strawberry River, Current Creek confluence to Soldier Creek Dam.	21.79	21.79	21.79	0	0
Tributaries to Starvation Reservoir except 10.04 0	Strawberry River-2	Strawberry River-tributaries, Starvation Reservoir to Avintaquin Creek confluence.	16.09	16.09	Nutrients 16.09	0	0
Strawberry River, confluence Duchesne River 4.26 4.26 0  eek Tributaries to Current Creek Reservoir. 58.98 0	Starvation Tribs	Tributaries to Starvation Reservoir except	10.04	0	ı	ı	ı
Current Creek-tributaries, Red Creek Confluence to Current Creek Reservoir.  Tributaries to Red Creek Reservoir.  Red Creek-tributaries, confluence Current  Red Creek Reservoir.  Total Creek Creek Reservoir.  Total Creek Total Creek Reservoir.	Strawberry River-1	Strawberry River, confluence Duchesne River	4.26	4.26	4.26	0	0
Current Creek-tributaries, Red Creek 60.12 Nutrients 0 confluence to Current Creek Reservoir. 15.53 0 Red Creek-tributaries, confluence Current 15.55 Nutrients 0 Creek to Red Creek Reservoir. 15.55 15.55	Upper Currant Creek	Tributaries to Current Creek Reservoir.	58.98	0	,	,	ı
Tributaries to Red Creek Reservoir. 15.53 0 Confluence Current 15.55 15.55 Nutrients 0 Creek to Red Creek Reservoir.	Middle Currant Creek	Current Creek-tributaries, Red Creek confluence to Current Creek Reservoir.	60.12	60.12	Nutrients 60.12	0	0
Red Creek-tributaries, confluence Current 15.55 15.55 Nutrients 0 Creek to Red Creek Reservoir.	Upper Red Creek	Tributaries to Red Creek Reservoir.	15.53	0			ı
	Lower Red Creek	Red Creek-tributaries, confluence Current Creek to Red Creek Reservoir.	15.55	15.55	Nutrients 15.55	0	0

Ber	Table 12-4 [303(d) List] (Continued) Beneficial Use Assessment for Water Bodies Located in the Uintah Watershed Management Area	ist] (Conti	nued) intah Water	shed Manager	nent Area	
Water Body Name	Water Body Description	Stream Miles	Miles Assessed	Miles Fully Supporting	Miles Partially Supporting	Miles Not Supporting
Lower Currant Creek	Currant Creek-tributaries, confluence Strawberry River to Red Creek confluence.	4.74	4.74	Nutrients 4.74	0	0
Avintaquin Creek	Avintaquin Creek-tributaries, confluence Strawberry River to headwaters.	54.37	54.37	Nutrients 54.37	0	0
Willow Creek	Willow Creek-tributaries, confluence Strawberry River to headwaters.	17.47	0	ı	•	ı
Timber Canyon Creek	Timber Canyon Creek-tributaries, confluence Strawberry River to headwaters.	15.53	0	ı	•	ı
WILLOW CREEK						
Upper Willow Creek	Willow Creek-tributaries, near Meadow Creek confluence to headwaters.	122.75	0	ı	•	ı
Willow Creek	Willow Creek-tributaries, confluence Green River to Meadow Creek confluence (except Hill Creek).	57.54	57.54	0	303(d) 57.54	0
Hill Creek	Hill Creek-tributaries, confluence Willow Creek to headwaters.	81.73	0	ı	ı	ı
LOWER GREEN RIVER/DESOLATION						
Green River-1	Green River, from cataloging unit boundary to Duchesne River Confluence.	121.4	121.4	121.4	0	0
Pariette Draw Creek	Pariette Draw Creek-tributaries, confluence Green River to headwaters.	54.13	54.13	0	0	303(d) 54.13
Nine Mile	Nine Mile Creek and tributaries., confluence Green River to headwaters.	118.89	118.89	0	303(d) 118.89	0
Upper Range Creek	Range Creek-tributaries, Range Creek Pumping Station to headwaters.	8.72	0	1	ı	ı
Middle Range Creek	Range Creek-tributaries, from water diversion to Range Creek Pumping Station.	15.98	0	1	1	ı
Lower Range Creek	Range Creek-tributaries, confluence Green River to Rah diversion.	9.51	9.51	9.51	0	0
(-) = Insufficient Data d = 303(d) List of Source: Division of Water Quality - Uintah	d = 303(d) List of Impaired Water ater Quality - Uintah Watershed Management Unit Stream Assessment Study (1997).	ream Asse	ssment Stuc	ıy (1997).		

Table 12-4 shows those stream segments that were determined not to be supporting at least one of their designated beneficial uses. These are called "water quality limited segments" and are placed on a list called the "303(d) list of impaired waters." This list is submitted to EPA every two years and identifies those waters that are not meeting water quality standards or are assessed as not fully supporting one or more of their designated beneficial uses. Also identified in Table 12-4 are waters exceeding phosphorus indicators. Detailed data from 97 water bodies are also indicated there.

#### Green River/Flaming Gorge Area

The main stem Green River and all perennial tributaries to Flaming Gorge Reservoir in Utah were assessed to be fully supporting all of their beneficial uses.

#### **Blacks Fork Area**

All waters in Utah in this study area fully meet their beneficial use class.

#### **Muddy Creek Area**

Only a very small portion of the headwater to this stream occurs in Utah, and it was not assessed.

#### Lower White River Area

The White River was assessed as fully supporting all of its beneficial use classifications. Evacuation Creek, an intermittent and often saline stream, could be a significant source of total dissolved solids entering the White River under certain conditions. Sample concentrations exceeded the state standard in 18 of the 19 TDS samples analyzed. The mean concentration was 3,041 mg/l.

High concentrations of total dissolved solids were also observed in Bitter Creek as well as its tributary, Sweetwater Creek. Neither of these streams was assessed because the streams were coded as intermittent.

#### Lower Green River/Diamond Mountain Area

The main stem Green River meets all standards. All tributary streams in this study area

that were assessed fully met their beneficial standards.

#### Ashley/Brush Area

Ashley Creek - Because of selenium, TDS levels and agricultural activities, the lower 16 miles of Ashley Creek were found not to meet its beneficial use standards. This stream segment also has a fish consumption advisory on it because of the elevated levels of selenium found in fish tissue. Irrigation return flows probably add to the elevated concentrations of total dissolved solids and selenium in this segment. Several point sources discharge high concentrations of total dissolved solids into Union Canal and then flows into the creek.

Brush Creek was assessed as meeting all of its beneficial use standards.

#### **Duchesne River Area**<sup>60,68</sup>

Portions of the main stem of the Duchesne River were assessed as partially supporting its beneficial uses. High concentrations of total dissolved solids (TDS) were the reason for assessing the Duchesne River from its confluence with the Green River to Myton as only partially supporting its agricultural classification (Class 4). The segments in this section also had high levels of total phosphorus in the Strawberry River confluence area. The primary source of the high salinity and total phosphorus was attributed to irrigation return flows. The remainder of the Duchesne River, from Myton to the confluence of the West Fork of the Duchesne River, had high concentrations of total phosphorus.

Lake Fork River from its confluence with the Duchesne River to the Pigeon Water Creek confluence was assessed as not supporting its cold water game fish classification (Class 3A).

According to the Central Utah Project Report (1995), high temperatures and silt were the causes of an impaired fishery habitat in this section. The report listed the sources as hydrological modification, habitat modification and return irrigation flows. The segment of stream from the Pigeon Creek confluence to the Yellowstone River confluence was assessed as partially supporting its Class 3A beneficial use. Habitat alteration caused

by hydrological shifting of the stream was listed as the cause and source of the impacts for this stream segment (CUP, 1995). The upper segments of Lake Fork River and its tributaries were assessed as fully supporting all of their beneficial uses.

Zimmerman Wash, depending on the flow, could be a significant contributor of total dissolved solids (TDS) and nutrients to the lower portion of Lake Fork River. The TDS concentrations exceeded the state standard in about 45 percent of the samples. Zimmerman Wash was not assessed because it is an intermittent stream.

Dry Gulch and Cottonwood creeks, including their tributaries, were assessed as not supporting their agricultural classification. High levels of total dissolved solids exceeded the state standard for agriculture usage in almost 50 percent of the samples. The mean concentration was 1,807 mg/l. This area has significant irrigation return flows, grazing and, according to the NRCS (1997), there may be some natural contribution of salinity to these streams in this area.

Antelope Creek was assessed as not supporting its agricultural use. It was also identified as having high levels of total phosphorus. Irrigation return flows, grazing and habitat alteration are thought to be the most significant sources of total dissolved solids and total phosphorus in the creek.

The lower nine miles of the Uinta River were assessed using water quality data collected from the CUP report (1995). It was assessed as not supporting its agricultural and aquatic life classifications (Class 3B). Salinity (TDS) exceeded the state standard in eight of the 19 samples collected. Temperature and sediment were listed in the CUP report as major impactors of the fishery. Sources of adverse impacts on the stream were irrigation return flows and hydrological modification of the stream channel. About three more miles of the Uinta River above this segment were assessed as partially supporting the 3B classification but not supporting agriculture usage. The remainder of the Uinta River upstream to the National Forest Boundary



Upper Duchesne River

was assessed as only partially supporting its cold water game fish classification. The cause was listed as habitat modification, and the source was stream channel modification. The upper portion of the Uinta River was assessed as fully supporting all of its beneficial uses.

#### Canals

The water quality in several canals was evaluated to determine if it may be contributing pollutants to lakes and reservoirs as well as streams in the area.

Dry Gulch "C" Canal - Data collected above Big Sand Wash Reservoir indicated the parameter concentrations in the water were well within state standards for waters that would be acceptable for drinking water, cold water game fish and agriculture uses.

Ouray Park Canal - Data collected on Ouray Park Canal indicated that the water quality was within state standards and pollution indicators for all parameters except total phosphorus. The concentration of total phosphorus progressively increased down the canal. Above Pelican Lake, the concentration exceeded the state indicator value of 0.05 mg/l in 11 out of 18 samples collected. The mean concentration was 0.085 mg/l. This indicated that the canal was a significant source of total phosphorus entering Pelican Lake. Pelican Lake is currently a Clean Lakes project. It is listed on the 303(d) list of

water bodies as having total phosphorus, dissolved oxygen and pH problems.

Brough Reservoir Spillway - Data were collected because of the desire to learn what effects any spillway flow might have on downstream Pelican Lake. Only four samples were collected at this site, but data indicated that the water was within the standards for the parameters for Class 3A and Class 4 waters.

Ouray School Canal and Dry Gulch Canal - Only field parameters, including pH, temperature, dissolved oxygen and conductivity, were measured at the stations on these canals. Relatively high conductivity readings were observed at the Ouray School Canal. The station on Dry Gulch Canal did not have conductivity readings as high.

#### **Strawberry River Area**

The Strawberry River from Starvation Reservoir to the Avintaquin Canyon Creek confluence was assessed as having elevated levels of phosphorus. Portions of Currant Creek, Red Creek and all of Avintaquin Creek also had elevated levels of total phosphorus. These stream segments need further evaluation to determine if there is an impact to the fisheries. Indian Canyon Creek was assessed as not supporting its agriculture uses because of high levels of total dissolved solids (salinity). It also had high levels of phosphorus.

#### Lower Green River/Desolation Canyon Area

Waters of the main stem Green River were assessed as fully supporting their use class. Each of the small streams listed below flow directly into the Green River. Pariette Draw was only assessed for agricultural use because insufficient data were collected to assess it for its other classifications. Eleven of 13 samples exceeded the state standard for total dissolved solids, and it was assessed as not supporting its classifications. The sources of the problem were irrigation return flows, grazing and habitat modification.

Nine Mile Creek was assessed as not supporting its aquatic life classification, because of high water temperatures. Habitat modification and irrigation were factors causing the high temperatures in the stream.

The lower segment of Range Creek was assessed as fully supporting its beneficial uses. The middle and upper reaches were not assessed.

Rock Creek, a tributary to the Green River, was not assessed because it was classified as an intermittent stream.

#### Willow Creek Area

This stream also flows directly into the Green River. Excessive levels of total dissolved solids were the reason for listing Willow Creek from Green River to the Meadow Creek confluence as partially supporting its agriculture beneficial use.

A major concern is the pollution occurring at sites associated with water-based recreation. Flaming Gorge and Strawberry reservoirs are primary examples. Activities that pollute the drinking water at these sites include vehicles parked on the beaches, boats that leak oil, dogs, inadequate sanitary facilities, two-cycle watercraft motors, and cattle and wildlife grazing in nearby watersheds.

Table 12-5 lists the point sources in the Uintah Basin watershed having discharge permits and monitored by the Division of Water Quality.

#### 12.4.2 Groundwater

High stream flows in the spring often leads to overirrigation, which may result in deep percolation far beyond leaching requirements. Drainage flows intermingle with salt-bearing formations such as Mancos Shale, increasing salt pickups beyond what would occur naturally. Seepage from canals and laterals, especially where the canal passes areas of high infiltration, can increase salt pickups in Mancos Shale areas.

Most groundwater pollution is from natural geologic sources such as the Green River and Wasatch formations. Excesses of selenium and alkali have been monitored in Stewart Lake. The state standard of five micrograms per liter established for wildlife protection has been exceeded in the drain water to Stewart Lake. Studies completed at Stewart Lake Waterfowl Management Area, Lower Ashley Creek, Ouray National Wildlife Refuge and Pariette Wetlands

#### **Table 12-5 Potential Point Sources**

Source

Manila Lagoons

**USBR-Flaming Gorge WWTP** 

**USFW-Jones Hole FH** 

USBR Upper Stillwater Dam 001

Whiterocks FH

Ashley Valley WTP

Ashley Valley 001 Effluent

Ashley Valley 002 (Winter Storage Pond) DIS

Neola Lagoons

Intermountain Concrete Company Outfall

Intermountain Concrete Company Pumped

Discharge

Equity Oil 001 Formally 002

Equity Oil Company Combined Effluent AB CNFL

Equity Oil Effluent No. 001 Discontinued

McKenzie Petroleum Company (002)

McKenzie Petroleum Company (001)

Hollingsworth and Travis Company Effluent

V & W Oil (Precision)

DenverAmerica-BHP Fort Duchesne Lagoons

Penzoil Products Co. Effluent Roosevelt Lagoons

**Duchesne Lagoons** 

American Gilsonite 017 (W of 007)

American Gilsonite 007

Ziegler Chemical 003 1/2 Mile W/SW of Office

Ziegler Chemical 004 100 Yards N of Office

Ziegler Chemical 001+002 1/4 Mile S/SE of Office

American Gilsonite Discharge 006

American Gilsonite Discharge 021/004 1/4

American Gilsonite #18 WNW of Hdgtrs Bonanza

**WWTP** 

American Gilsonite Discharge 008

American Gilsonite Discharge 009

American Gilsonite 019 (E of 020)

American Gilsonite 020 (E of 016)

American Gilsonite Discharge 010

American Gilsonite 016 (N of Ziegler & E)

Lexco Inc.

Penzoil Products Co., Roosevelt

Source: Utah Department of Environmental Quality, Division of Water Quality, 1997.

identified several areas where selenium85 was adversely affecting water quality and creating a hazard to wildlife. The source of contamination at Stewart Lake<sup>86</sup> is drain water and shallow

groundwater from soils derived from Mancos Shale. Median selenium concentrations in all drain water discharged to Stewart Lake exceeded the state standard established for wildlife protection of five micrograms per liter. Selenium concentrations in biological tissues sampled at Stewart Lake Waterfowl Management Area were high compared to concentrations in the biota from most other sites in the middle Green River Basin.

Selenium concentrations in Ashley Creek<sup>84</sup> upstream of the city of Vernal generally were less than one microgram per liter, but 12 miles' downstream concentrations averaged 73 micrograms per liter. The source of the contamination is believed to be from inflows of shallow groundwater as well as sewage lagoon system seepage that flows through Mancos Shale and mobilizes selenium. Waterfowl from the area contained selenium concentrations as high as 27.2 micrograms per gram in muscle tissue and an eared grebe egg contained 71 micrograms per

Selenium contamination of ponds at Ouray National Wildlife Refuge was limited to a small area on the western part of the refuge, due to seepage of shallow groundwater into waterfowl ponds. Geometric mean concentrations in plants, invertebrates, bird eggs and fish from the North and South Roadside Ponds were larger than concentrations known to cause reproductive failure in mallards (Anas platyrhyncos). Mallards exposed during a field experiment at the Roadside Ponds quickly accumulated selenium in body tissues and died by the fourth week.

Water-quality deterioration in Pariette Wetlands was believed to be due to the discharge of tail water and accrual of groundwater into the area. Selenium concentrations in the biota from Pariette Wetlands ranged from fairly low, near background levels to highly elevated levels associated with known adverse effects in the literature.

#### 12.5 Alternative Solutions

The Colorado River Salinity Control Program was developed to reduce the salt load carried to the Colorado River System by improving irrigation efficiency and reducing deep

percolation. The Uinta Basin Unit is a part of that program.

In agriculture, irrigators flush the salts from the soil to maintain good crop production. They do this by using extra irrigation water which percolates downward through the soil and then laterally to waterways. This process, known as leaching, eventually flushes salts into rivers and streams that empty into the Colorado River. Nearly half of the salts come from natural sources, such as precipitation runoff, while about a third comes from agriculture. The balance comes from point sources.

The NRCS Uinta Basin Unit Selected Plan (which includes the Duchesne and Ashley/Brush Valley drainages) projects a reduction of 52,400 acre-feet of return flow from on-farm irrigation, deep percolation and off-farm lateral seepage loss. It also projects a total of 106,800 tons of salt-load reduction to the Colorado River.

To accomplish these objectives, 64 percent of the potentially treatable irrigation farmland (137,000 acres) will be treated with on-farm improvements. The total irrigated area covers 201,120 acres. On-farm improvements, coupled with improved irrigation water management, reduce the salt-load contribution of this acreage. This program will also contribute to economic development by increasing agricultural production in an otherwise depressed area. An effort will be made to minimize wildlife habitat losses resulting from the program and, where possible, habitats will be developed, improved or preserved.

Mitigation for loss of wetlands and upland habitats consists of land owners setting aside areas exclusively managed for the propagation of wildlife species. These areas must show an increase in wildlife values. Wetland management includes nesting islands, plants, fencing, grazing management, water control and burning control. Upland management includes grazing management, plants, irrigation for wildlife food plots, windrows, and fencing controls for grazing during nesting periods.

Total monitoring and evaluation costs to date for 2,490 acres of wildlife wetland habitat and 12,750 acres of upland wildlife habitat have been \$478,170 (1996 Monitoring and Evaluation Report).

The objectives of the Colorado River Salinity Control Program are to provide financial and technical assistance to:

- Increase the average irrigation efficiencies throughout the Uintah Basin to 51 percent.
- Improve irrigation efficiencies on 137,000 acres of farmland.
- Install conservation practices to reduce salinity levels in the Colorado River by 106,800 tons of salt annually.
- Develop, improve and preserve wildlife habitats.
- Carry out research, education and demonstration activities.
- Carry out monitoring and evaluation activities.

#### 12.5.1 On-Farm Activities

Prior to implementation of the selected plan, a total of 35,100 acres received treatment through improved irrigation systems. An estimated 10,200 acres were improved with sprinkler systems, while 24,900 acres were treated with improved surface systems. Portions of the improvements were installed with assistance through the USDA Agricultural Conservation Program (ACP) costshare program.

As of 1996, a total of \$65,634,138 has been obligated for salinity funding. This amount of money covered 2,384 long-term agreements and annual contracts.

#### 12.5.2 Off-Farm Activities

The Bureau of Reclamation has completed one study (Phase I) and initiated a second phase study of the major canals and laterals. These studies identify the highest areas of seepage loss. The Phase I plan proposes to line 55.5 miles of canals and laterals to control high seepage loss. This equals 39 percent of the total miles evaluated

during the Phase I study. Implementation of Phase I has been postponed indefinitely. Phase II was initiated in 1986. The Bureau's preliminary findings for Phase II have been reported. The report recommends that planning investigation be terminated on Phase II. However, it also recommends that 3.2 miles of canal lining, and investigation of the use of canals to carry winter livestock water, be included in Phase I preconstruction activities. The Natural Resources Conservation Service will assist the Bureau of Reclamation in developing and coordinating treatment alternatives.

The U. S. Department of Agriculture (USDA) has completed improvements on some laterals in conjunction with planned on-farm irrigation system improvements. These lateral improvements are the result of farmer groups collectively piping water for the purpose of obtaining pressure to operate sprinkler systems and for water conservation. Farmers grouping together for this purpose will be a continuing occurrence in the project area. During nine years of CRSC funding, approximately 865,105 feet of off-farm pipeline have been installed. The Duchesne County Commission, in cooperation with the Duchesne County Water Conservancy District, is responsible for a new canal project. The project will include extensive improvements to the Payne Canal, the Sand Wash Irrigation Company Project, a Dry Gulch irrigation canal, a canal in Fruitland and a canal in the Lower Pleasant Valley area. It will take approximately four years to complete the canal rehabilitation project.

#### 12.5.3 Indian Lands

Approximately 70,000 acres of land in the Ute Tribe Reservation could be irrigated. Only 31,720 acres of Indian-owned lands and 29,280 acres of non-Indian lands are serviced with Indian water. These lands are interspersed throughout the Uintah Basin with other private and federal lands. The checkerboard pattern of land ownership makes it imperative that cooperation is obtained by all owners. About 749,900 acres of homestead lands are within the Uintah and Ouray Indian Reservation.

Responsibility for water quality issues on Indian lands has been delegated by the EPA to the Ute Tribe. The tribe may set its own standards in preparing and implementing water quality plans. About 3,000 acres of Indian lands have been operated by non-Indians treated under the Agricultural Conservation Program (ACP) using the annual practices. This is because long-term agreements are not allowed under tribal leasing arrangements.

The regulations in the CRSC program state that the USDA can cost-share with Indian tribes. Unfortunately, this provides the opportunity for the Ute Indian Tribe to only participate as a single entity with a cost-share payment approval limitation of \$100,000. This restricts the program opportunities.

Indian lands are administered by allotments, assignments, trust lands and private lands. Each has different rules and regulations. The Bureau of Indian Affairs has responsibility to oversee all these lands, whereas the Tribal Business Council has responsibility to provide leadership on assigned and trust lands. Under the restraints of different type ownerships, 25-year leases become extremely difficult. The allotted lands may have multiple assignments on the same parcel of land.

Due to the many institutional restraints imposed upon the Indian lands, successes in improving Indian lands and participation of the Ute Tribe or individual Indians in the USDA program have been rare.

Many meetings have been held with the Bureau of Indian Affairs and Ute Tribe officials to identify problems and overcome them. It was agreed a project with Indian lands as well as private lands should be identified. The Whiterocks Irrigation Project has been selected. The project covers 42.6 miles of canal, will prevent 2,220 tons of salt load each year in waterways, and covers approximately 4,020 acres that will save an additional 65,040 tons of salt load per year. The estimated cost for this project will be approximately \$5 million. A second project is the Randlett Tribal Farm which consists of 1,100 acres of tribal land. The estimated cost of this project is approximately \$750,000.

Agricultural practices can be changed to minimize the animal waste entering streams. Stream bank erosion can also be prevented. Information and education programs can be developed to teach urban citizens about reducing urban pollution runoff to waterways. Cities and counties can be zoned to protect water quality and raise awareness of land developers about how construction activities can impact water quality.

#### 12.6 Issues and Recommendations

Water quality issues are primarily associated with agriculture and oil and gas drilling. While the agricultural sector has reduced non-point source pollution such as phosphorus and TDS, urbanization has led to increasing pollution from point sources.

#### 12.6.1 Colorado River Salinity Impact

**Issue** - Runoff from irrigated agriculture in the Uintah Basin increases salt-loading to the Colorado River.

**Discussion** - Abundant irrigation water in the spring season leads to excess irrigation and deep percolation. Drainage flows seep into salt-bearing materials, increasing salt pickup. This salt-laden water flows to the Green River then to the Colorado River, increasing the salinity downstream.

Adequate leaching takes only about 10 percent more irrigation water than the crop requires. The emphasis is to reduce salt pickup by reducing deep percolation from irrigation. This can be achieved with improved irrigation methods along with modifying or replacing the irrigation system. For example:

- Irrigation efficiencies should be improved either by conversion to sprinkler systems or by improving surface irrigation methods.
- Where the land contour inherently promotes flood or border irrigation inefficiencies, sprinkler systems could reduce runoff and provide more uniform water application.

- Irrigation scheduling and water management education programs should be expanded.
- Seepage from canals and laterals can be reduced by lining them with clay soils, plastic or asphalt membranes, slip-formed concrete, or piping with plastic, steel or concrete pipe.

**Recommendation** - The federal government should increase funding to the on-farm (USDA) and off-farm Bureau of Reclamation salinity programs to achieve goals in salinity reduction.

#### 12.6.2 Oil/Gas Well Drilling and Production

**Issue** - Water and land contamination due to oil/gas well drilling and production needs to be reduced.

Discussion - Potential impacts to surface hydrology may be the result of construction and maintenance of access roads, well pads and pipelines as well as pits, use of water for drilling and disposal of waste water. Impacts to water quality include increased sedimentation, human waste pollution-loading, chemical pollution-loading, and oil and/or gas discharges. These effluents must comply with permit requirements of the Federal Water Pollution Control Acts, National Pollution Discharge Elimination System (NPDES) and the standards of water quality for the state of Utah code, as annotated. Wetland protection must comply with Section 404 of the Clean Water Act, 1972.

**Recommendation** - The Bureau of Land Management, Forest Service and the Utah Division of Water Quality should increase monitoring the water quality in selected drainages for any presence of effluent from oil and gas development projects.

## 12.6.3 Elevated Levels of Phosphorus and Total

**Dissolved Solids Issue** - Elevated levels of total phosphorus and total dissolved solids in several basin streams indicate possible impairment to these waters.

**Discussion** - Phosphorus and total dissolved solids in streams are viewed as indicator

pollutants in the *Standards of Quality for Waters* of the State, R 317-2, Utah Administrative Code, but are not regulated substances themselves. They indicate that further work with dissolved oxygen, sediment, riparian condition, stream habitat, limnology and macro invertebrate ecology is necessary to establish if the waters are meeting their beneficial use class.

Recommendation - The Utah Division of Water Quality, Division of Wildlife Resources, U. S. Fish and Wildlife Services, Bureau of Land Management, Forest Service and others should cooperate in future data-gathering and analysis. □